

Unit 8
Acute Triangle Trigonometry

What we know:
How to solve for unknown angles and sides in a triangle if there is a RIGHT ANGLE.
SOH CAH TOA

What we need to know:
How to solve for unknown sides and angles in an acute triangle:
a triangle **WITHOUT A RIGHT ANGLE**

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8.1/8.2
The Sine Law

When do you use the Sine Law?

- ★ NO right angle in the triangle.
- ★ You are given 2 angles and any side.
- or
- ★ You are given 2 sides and an angle that is NOT the contained angle.

What does this mean?
You need a "pair" of angle and opposite side.

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To find an angle:

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

To find a side length:

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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Ex. #1: Find the measure of AB to the nearest tenth of a metre.

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Ex. #1: Find the measure of AB to the nearest tenth of a metre.

$$\frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{25}{\sin 30^\circ} = \frac{c}{\sin 20^\circ}$$

$$\frac{25 (\sin 20^\circ)}{\sin 30^\circ} = c$$

$$\frac{25 (0.3420)}{(0.5000)} = c$$

$$17.1 = c$$

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Ex. #2: In $\triangle PQR$ $\angle P = 38^\circ$
 $p = 14.2m$
 $q = 21.3m$

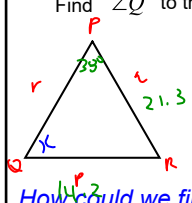
Find $\angle Q$ to the nearest degree.

How could we find angle R?

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Ex. #2: In $\triangle PQR$ $\angle P = 38^\circ$
 $p = 14.2m$
 $q = 21.3m$

Find $\angle Q$ to the nearest degree.



How could we find angle R?

$$\frac{\sin 38^\circ}{14.2} = \frac{\sin Q}{21.3}$$

$$\frac{\sin 38^\circ (21.3)}{14.2} = \sin Q$$

$$(0.6157)(21.3) = \sin Q$$

$$(0.9236) = \sin Q$$

$$\sin^{-1}(0.9236) = \angle Q$$

$$67^\circ = \angle Q$$

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Homework

Pg. 432 # 2, 3bdf, 4, 5c, 6, 9, 11

Try: Pg. 434 # 15

p. 413 #11

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